APHIS Factsheet

Wildlife Services

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GonaCon™–Birth Control for Deer: Questions and Answers

Q. What is GonaCon™?
A. GonaCon™ is a new gonadotropin-releasing hormone (GnRH) immunocontraceptive vaccine developed by scientists at the U.S. Department of Agriculture's (USDA) Wildlife Services' (WS) National Wildlife Research Center (NWRC). Presently, applications of GnRH are being researched in controlled field studies for potential commercial feasibility.

Q. How does GonaCon work?
A. The single-shot, multiyear vaccine stimulates the production of antibodies that bind to GnRH. GnRH is a hormone in an animal's body that signals the production of sex hormones (e.g., estrogen, progesterone, and testosterone). By binding to GnRH, the antibodies reduce GnRH's ability to stimulate the release of these sex hormones. All sexual activity is suspended, and animals remain in a nonreproductive state as long as a sufficient level of antibody activity is present.

Q. How does GonaCon stimulate the production of antibodies?
A. GonaCon causes an animal's body to make antibodies against its own GnRH. To do this, WS scientists synthesize and hook GnRH to a foreign protein. This material looks like a giant, new molecule that the animal's immune system has never encountered. As a result, when it is injected into the animal's body, the body's immune response neutralizes the hormone's function, resulting in infertility.

Q. What are the health effects associated with GonaCon?
A. The health effects associated with GonaCon are minimal. In field and pen studies, animals showed no evidence of inflammation at injection sites, and blood chemistry was similar among treatment and control groups. Vaccinated animals showed a decrease in sexual activity and breeding behavior.

Q. Are there any dangers or secondary hazards to humans or other animals that eat meat from vaccinated deer?
A. There are no dangers associated with eating deer that have been vaccinated with GonaCon. As with other vaccines, such as those used with livestock, both the vaccine and the antibodies produced are proteins. Once ingested, they are broken down by stomach acids and enzymes.

Q. How long does GonaCon last?
A. It depends upon the individual animal and its response to the vaccine. GonaCon has successfully kept female deer infertile for 2 to 4 years.

Q. Can GonaCon be used with other wildlife species?
A. In addition to white-tailed deer, GonaCon has proven effective for use with other wildlife species, including California ground squirrels, Norway rats, feral cats and dogs, domestic and feral swine, wild horses, and elk. Since registering the contraceptive is time consuming and costly, WS has decided to focus registration efforts on use for white-tailed deer. Future research will likely be directed toward registering GonaCon for use with other wildlife species.

Q. What are the benefits of GonaCon?
A. Because it is a single-shot, multiyear vaccine, GonaCon is a practical management tool. Deer only need to be injected once to become infertile for up to 4 years. The vaccine can be used in urban and residential areas, where other management methods, such as hunting, are not an option.

Q. What are the limitations of GonaCon?
A. GonaCon must be injected into the muscle or tissue of each animal. Eventually, WS scientists hope to produce an oral GnRH vaccine bait that will be attractive to deer but not other animals.

Q. How much does GonaCon cost?
A. The main cost of using GonaCon is associated with the time and money required to either trap and inject or dart the deer. The vaccine itself only costs $2–$10 per dose. The estimated cost of trapping or darting a deer ranges from $500 to $1,000.

Q. How does GonaCon differ from PZP?
A. Porcine zona pellucida (PZP), another immunocontraceptive vaccine, has been used to sterilize dogs, coyotes, burros, wild horses, and white-tailed deer temporarily. The PZP vaccine, also known as SpayVac™, causes multiple estrus cycles in female deer. GonaCon, however, prevents female deer from entering estrus.

Q. Is GonaCon currently available to Federal, State, and local wildlife management agencies?
A. No fertility control agent has been approved by the Food and Drug Administration (FDA) for noninvestigational use on wildlife populations in the United States. Several materials, however, including GonaCon, have been classified as investigational drugs that may be used in rigidly controlled research studies. The GonaCon studies underway in Maryland, New Jersey, and Pennsylvania are being conducted as pivotal studies that are required as part of FDA's approval process for a new animal drug. The approval process for GonaCon vaccine began in 1997, when FDA established an investigational new animal drug exemption for the GnRH vaccine. All research studies of GnRH vaccine have been conducted under this exemption. NWRC is working with FDA to obtain new animal drug approval for GonaCon with the hopes of then partnering with a private company to take the vaccine to market.

Q. Will GonaCon eliminate the need for hunting?
A. No. Contraception alone cannot reduce overabundant deer populations to healthy levels. GonaCon is a tool to be used in conjunction with other wildlife management methods.

Q. What studies are currently being done with GonaCon?
A. Ongoing field studies near Silver Spring, MD, are providing additional data on the efficacy of the vaccine on white-tailed deer. At a fenced military facility, 28 adult does were captured, equipped with eartags and radiotelemetry transmitters, and injected with GonaCon. The reproductive behavior and reaction of these does will be monitored for 2 years and compared with those of 15 unvaccinated adult does that inhabit an adjacent, enclosed parcel of similar habitat. Preliminary data from 2005 shows the vaccine to be 85–90 percent effective in treated deer.

In July 2005, a similar field study involving another 30 to 40 deer was started in Morris County, NJ. Results from this and the Maryland study will aid in the final FDA approval process for establishing GonaCon as a new animal drug.

WS scientists are collaborating with Pennsylvania State University to conduct pivotal studies required by FDA on the toxicity and safety of GonaCon in captive deer. Responses of treated and control groups of deer will be compared via blood and tissue analyses. Preliminary data show no differences between treatment and control groups.

Q. What does WS hope to accomplish with these studies?
A. Data from field and pen studies will aid in the final FDA process for approving GonaCon as a new animal drug.

Q. What other agencies or organizations are involved in these studies?
A. USDA's WS is working with the following agencies and organizations to develop and test GonaCon:

- The Pennsylvania State University
- U.S. General Services Administration
- U.S. Department of Defense
- USDA's Veterinary Services

Q. What is the NWRC mission?
A. The NWRC is the research arm of USDA's WS program, a nonregulatory program that provides Federal leadership in managing conflicts with wildlife. NWRC applies scientific expertise to the development of practical methods to resolve human–wildlife conflicts and maintain the quality of the environments shared with wildlife.

Q. How do I obtain more information on this subject?
A. For more information on GonaCon and WS' National Wildlife Research Center, please go to http://www.aphis.usda.gov/ws/nwrc on the Web.